



Forensic Science | 3.2 Murder at the Farm Activity

Introduction:

In this lab, you will read through a fictitious crime scenario titled: “Murder at the Farm”. As you progress through the scenario, you will want to be sure that you are clicking every button and reading every piece of evidence. By the end, you should be able to pinpoint the perpetrator and answer the analysis questions within this lab.

Materials:

Use the activity with the link below:

[Murder at the Farm Scenario Link](#)

Procedure:

1. Access the “Murder at the Farm” crime scenario using the link above.
2. As you progress through the scenario, take careful note of the details given and complete the tables below as indicated. Once you have progressed through the entire scenario, proceed to the conclusion section to formally charge the suspect with murder.
3. Once you have charged the suspect, answer the questions in the analysis section. If you are unsure of an answer, try reviewing the scenario again to locate clues you may have missed initially.

Data: (5 points)

Table 1: Articles of Evidence - All **rows** in this data table should be filled in if you have found all of the clues! Although, some information for each **column** may be missing or unknown.

Article of Evidence	Where was it found?	Source-who/what/where did it come from?	Description/Comments
#1Dog hair	Inside the barn	Dog	
#2Sheep hair	Inside the barn	Sheep	
#3Cat Hair	Inside the barn	Cat	
#4Rabbit hair	Inside the barn	Rabbit	
#5Mouse hair	Inside the barn	Mouse	
#6White cotton fiber	On the victim's red flannel shirt		
#7Black Nylon thread	On the ground near victim	Sports jacket	
#8Pine pollen	Covering victim's clothing evenly	Pine tree	
#9Lily pollen	Smear of dirt on victim's jeans in shoe marking from perpetrator	Perpetrator's shoe	
#10Hair with unusual characteristic		Ruth	
#11Blonde hair		possibly victim	
#12Hair samples		Each person who had been on the farm, and anna	
#13John's		John	

computer			
#14 Woman's black sports jacket	Hanging in the barn	Ruth	
#15 Lily plant	McDonald house		

Table 2: Persons of Interest - By filling in the spaces in this table, you should discover the *most likely* perpetrator of the crime!

Name	Relationship to victim	Ruled out? (Yes/No)	Comments
Anna Green #1	Girlfriend	yes	alibi
Molly McDonald #2	Daughter of Edward	no	
Edward McDonald #3	Employer	yes	alibi
Jim Davis #4	Veterinarian	yes	alibi
Ruth McDonald #5	Wife of Edward	no	

Make notes about any additional evidence you may have noted throughout the investigation (such as any new information learned during the questioning of the persons of interest) here:

John was in a fight with his girlfriend.

Conclusion: (4 points)

1. Who are you charging with murder in this case?

Ruth McDonald

2. What was his or her motive?

Her daughter was dating John and she thought she deserved better.

Analysis: (1-14 =5 points)

1. How did you exclude the other persons of interest?

Most of them had alibis

2. How did you figure out who the real perpetrator was?

All the evidence pointed to Ruth

3. Which hair and fiber analysis methods were helpful in this case?

Hair dye and nylon fiber analysis because those pointed to the killer

4. Was the suspect hair found on the victim considered class or individual evidence?

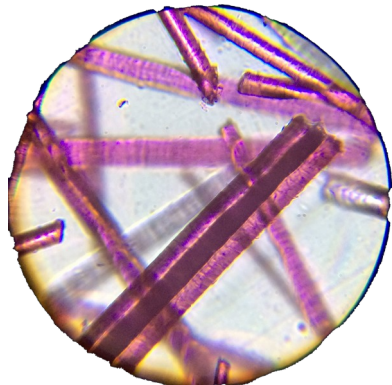
Class

5. Why was the hair considered that type of evidence?

Because it was dyed brown but not DNA tested

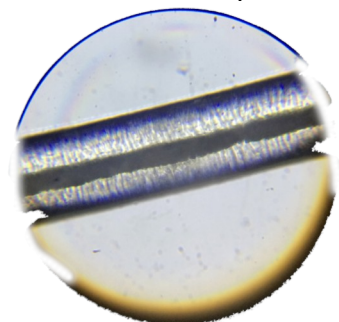
6. How could the Forensic investigators determine if the hairs found were human or animal?

7. Is the hair pictured here human or animal in origin? Animal



8. Explain why you know that it is that type of hair. Shorter

9. Is the hair pictured below human or animal in origin? Human



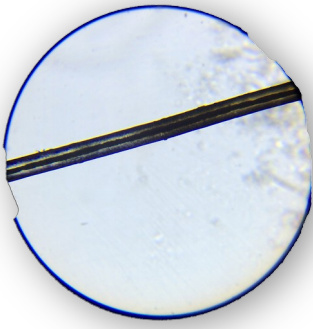
10. Explain why you think that it is that type of hair.

Longer

11. Could the blonde hair found on the victim be positively identified as belonging to him in any way? If so, how?

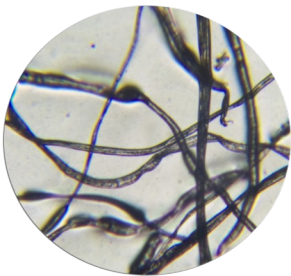
Yes if they did a DNA test

12. How do you explain the unusual characteristic seen in the hair found on the victim and in this evidence photo? The hair is dyed



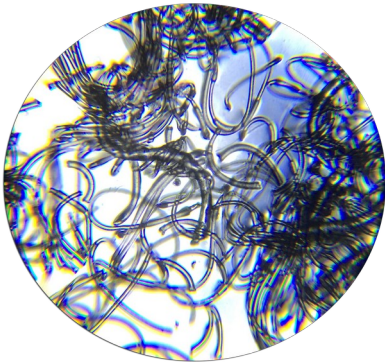
13. Identify which of the fibers from the crime scene (below) is a natural fiber and which is a synthetic fiber.

A.



Natural or Synthetic? Why? **Natural, because it's not uniform**

B.



Natural or Synthetic? Why? **Synthetic, Because it's uniform**

14. This case had no individual evidence at the crime scene, yet you had enough evidence to lead you to an arrest. How can class evidence be used to lead to an arrest when no individual evidence is found? **When one person fits the class of multiple pieces of evidence**

15. A box of hair and fiber samples came into the lab in a jumbled mess. The new CSI tech that was hired did not place the fibers in separate paper bindles as he was supposed to do. As a result, you have 5 fibers that you must sort and classify. Calculate the Medullary Index of each sample with a medulla present and classify them as either animal or human in origin. (1 point/ sample = 5 points)

Medullary Index = Medulla Diameter ÷ Hair Diameter

Remember:

- Results less than 0.33 generally indicate human hair.
- Results greater than 0.50 generally indicate other animal hair

Sample 1: Medulla Diameter: 2.8 Hair Diameter: 10

Medullary Index: 0.28

Human or Animal? Human

Why? Because it's below 0.33

Sample 2: Medulla Diameter: 5.3

Hair Diameter: 9.3 Medullary Index: 0.57

Human or Animal? Animal

Why? It's greater than 0.5

Sample 3: Medulla Diameter: Absent Hair Diameter: 11.2

Medullary Index: Unknown

Human or Animal? Unknown

Why? Because we can't find the medullary index without the diameter

Sample 4: Medulla Diameter: 1.9 Hair Diameter: 9.6

Medullary Index: 0.2

Human or Animal? Human

Why? It's less than 0.33

Sample 5: Medulla Diameter: 5.8 Hair Diameter: 10.9

Medullary Index: 0.53

Human or Animal? Animal

Why? It's greater than 0.50

16. As you were checking the box one last time for any additional evidence samples, you notice an additional sample in the bottom of the box just under one of the bottom flaps. It was labeled "Cotton Sample 2". You took the sample and viewed it under the microscope. You measured the medulla and found that the Medullary Index was 0.57. You immediately realized that the sample had been labeled incorrectly. Why? (1 point)

Cotton doesn't have a medulla